

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

Amendments to the Claims:

Please amend claims 1-4 and 6-11 as follows. The following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended). A liquid pressurizing device comprising:

a reciprocating pump for pressurizing and delivering a high pressure liquid through reciprocating motion of a plurality of plungers;

rotary servo motor means for driving the reciprocating motion of the plurality of plungers;

pressure measuring means for measuring an actual delivery pressure value of said high pressure liquid;

pressure control means for adjusting a feed rate of reciprocating motion of said plungers so that the actual delivery pressure value measured by said pressure measuring means is converged to a preset pressure value as a desired value;

means to compare the measured actual delivery pressure value with a predetermined threshold which is close to and lower than said preset pressure value;

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

means to control the reciprocating motion of the plurality
of plungers through said rotary servo motor means depending on
the result of the comparison to make the actual delivery pressure
20 value reach the predetermined threshold if the threshold has not
been reached;

means for ~~determining~~ to determine the feed rate as an
optimum feed rate of the reciprocating motion of the plurality of
plungers when the threshold is reached ~~after the actual delivery~~
25 ~~pressure value reaches a predetermined threshold; and~~

means ~~for maintaining~~ to control the feed rate of the
reciprocating motion of the plurality of plungers through said
rotary servo motor means at said optimum feed rate after the
threshold has been reached.

Claim 2 (Currently Amended). A liquid pressurizing device
according to claim 1, wherein said pressure control means
comprises a proportional control means for performing, after the
actual delivery pressure value has reached the predetermined
5 threshold, the proportional control of the actual delivery
pressure value during a time ~~[[until]]~~ taken for the plungers to
first reach an end of a forward stroke ~~end thereof.~~

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

Claim 3 (Currently Amended). A liquid pressurizing device
10 according to claim 1, wherein ~~after said optimum feed rate has
been determined,~~ said pressure control means further comprises
means to correct ~~corrects~~ the feed rate on the basis of the
deviation between the actual delivery pressure value and said
preset pressure value when the direction of the reciprocating
15 motion of the plurality of plungers is changed after said optimum
feed rate has been determined.

Claim 4 (Currently Amended). A liquid pressurizing device
according to claim 1, wherein ~~after said optimum feed rate has
20 been determined,~~ said pressure control means further comprises
means to temporarily ~~[[sets]]~~ set the feed rate to a rate higher
than said optimum feed rate when the direction of reciprocating
motion of the plungers is changed after said optimum feed rate
has been determined.

Claim 5 (Original). A liquid pressurizing device
comprising:

a reciprocating pump for pressurizing and delivering a high
pressure liquid through the reciprocating motion of a plurality
5 of plungers;

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

pressure measuring means for measuring an actual delivery
pressure value of said high pressure liquid;

a nozzle for injecting said high pressure liquid;

pressure control means for adjusting the feed rate of
10 reciprocating motion of said plungers so that the actual delivery
pressure value measured by said pressure measuring means is
converged to a preset pressure value as a desired value;

detecting means for detecting an injection state and a
suspension state of said high pressure liquid from said nozzle;

15 means for determining an optimum feed rate of the
reciprocating motion of the plurality of plungers after the
actual delivery pressure value reaches a predetermined threshold;
and

means for maintaining the feed rate of the reciprocating
20 motion of the plurality of plungers at said optimum feed rate,
wherein said pressure control means is responsive to the
detection of the suspension state by said detecting means to stop
the movement of said plungers when said preset pressure value is
nearly reached.

Claim 6 (Currently Amended). A liquid pressurizing device
according to claim 5, wherein said pressure control means is

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

responsive to the detection of the suspension state by said
detecting means to stop the movement of said plungers and is
5 responsible to the detection of a reinjection by said detecting
means to effect the movement of said plungers at said optimum
[[fee]] feed rate.

Claim 7 (Currently Amended). A liquid pressurizing device
comprising:

a reciprocating pump for pressurizing and delivering a high
pressure liquid through the reciprocating motion of a plurality
5 of plungers;

pressure measuring means for measuring the actual delivery
pressure value of the high pressure liquid;

a plurality of nozzles for injecting the high pressure
liquid;

10 pressure control means for adjusting the feed rate of
reciprocating motion of the plungers so that the actual delivery
pressure value measured by said pressure measuring means is
converged to a preset pressure value as a desired value; and

detecting means for detecting an injection state and a
15 suspension state of the high pressure liquid from each of said
nozzles;

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

means for determining an optimum ~~[[fee]]~~ feed rate of the reciprocating motion of the plungers with the control operation of the actual delivery pressure value after reaching a

20 predetermined threshold; and

means for maintaining the feed rate of the reciprocating motion of the plungers constant at said optimum feed rate,

wherein said pressure control means is responsive to the detection of any change between said injection state and

25 suspension state of each of said nozzles by said detecting means so that the feed rate of the reciprocating motion of said plungers is changed to the optimum feed rate corresponding to the injection state and suspension state of each of said nozzles after the change between the injection state and suspension
30 state.

Claim 8 (Currently Amended). A liquid pressurizing device according to claim 2, wherein ~~after said optimum feed rate has been determined,~~ said pressure control means further comprises means to correct ~~corrects~~ the feed rate on the basis of the
5 deviation between the actual delivery pressure value and said preset pressure value when the direction of the reciprocating

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

motion of the plungers is changed after said optimum feed rate has been determined.

Claim 9 (Currently Amended). A liquid pressurizing device according to claim 2, wherein ~~after said optimum fee rate has been determined,~~ said pressure control means further comprises means to temporarily [[sets]] set the feed rate to a rate higher
5 than said optimum [[fee]] feed rate when the direction of reciprocating motion of the plurality of plungers is changed after said optimum feed rate has been determined.

Claim 10 (Currently Amended). A liquid pressurizing device according to claim 3, wherein ~~after said optimum feed rate has been determined,~~ said pressure control means further comprises means to temporarily [[sets]] set the feed rate to a rate higher
5 than said optimum feed rate when the direction of reciprocating motion of the plungers is changed after said optimum feed rate has been determined.

Claim 11 (Currently Amended). A liquid pressurizing device according to claim 8, wherein ~~after said optimum feed rate has been determined,~~ said pressure control means further comprises

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

means to temporarily [[sets]] set the feed rate to a rate higher
5 than said optimum feed rate when the direction of reciprocating
motion of the plurality of plungers is changed after said optimum
feed rate has been determined.